MEDWIN PUBLISHERS
Committed to Create Value for Researchers

Open Access Journal of Botanical Insights

Floristic Composition and Ecological Characteristics of Tehsil Samar Bagh District Lower Dir

Case Report
Volume 1 Issue 1
Received Date: October 05, 2023
Published Date: November 21, 2023
DOI: 10.23880/oajbi-16000106

Muhammad RU[1]* and Muhammad NK[2]

[1]Department of Botany, University of Malakand KPK, Pakistan
[2]Mardan Department of Biotechnology Abdulwalikhan University, Pakistan

***Corresponding author:** Muhammad Rizwan Ullah, department of Botany, Govt. Ghazi Umara Khan Degree College Samar Bagh Affiliated with University Of Malakand KPK, Pakistan, Tel: +923000942926; Email: rizwandaryab222@gmail.com

Abstract

Usually identification of the flora all over the world is considered to be important and necessary because it plays a vital role to reserve National flora. The current study was conducted to explore and asses the floristic composition and ecological characteristics of Samar bagh District Dir lower along with their family, botanical name, habit, life form and leaf size classes. The flora of Tehsil Samar bagh comprises up of 120 species belonging 49 families. These 49 families consist of 6 gymnosperm species of family *Pinaceae* and *Cuperassesceae*, 8 monocot species of family *Amaryllidaceae*, *Cyperaceae*, *Poaceae* and 104 dicot species of 44 different families. As per the plant habit, there are 75 species of herb, 13 species of shrub and 32 species of tree. The leading and well-expressed family was *Asteraceae* attending 12 taxa, followed by *Rosaceae* with 10, *Solanaceae* with 9, *papilionaceae* with 7, *Moraceae* and *Poaceae* with 5, *Fagaceae, Brassicaceae, Euphorbiaceae, Lamiaceae* and *Amaranthaceae* contributing 4 plant species. The Life form and leaf size classes were managed by Raunkiaers system which displays that the headmost life form class was therophytes with 47 species, followed by nanophanerophytes with 21 species, chamaephytes with 13, and then by megaphanerophytes, hemicryptophytes, Geophyte and microphanerophytes. In leaf size classes leading class was microphyll representing 38 species followed by mesophyll with 37, nanophyll 24, macrophyll 9, leptophyll 7 and megaphyll with 5 species. Therophytes were observed dominant with high percentage, demonstrating that this area is a part of semi-arid zone of Khyber Pakhtunkhwah, Pakistan and indigenous people of this area thoroughly and extensively demolish and uproot the plants for burning purposes.

Keywords: Floristic Composition; Ecological Characteristics; Samar Bagh District Dir Lower; Raunkiaers System

Study Area

Samar Bagh is an administrative subdivision of Lower Dir District in the Khyber Pakhtunkhwah province of Pakistan. It is lying between 34.9117° North latitude and 71.6436° longitudes and is listed among Munda and Barawal. Samar bagh is situated at the north of District Dir lower, south of Bajaur agency, east of District Malakand and at west of Afghanistan [1]. The area is mainly mountainous and rarely planed. Mountainous regions are mostly rocky and therefore comprises of sandy soil and sometimes silt soil, that's why the mountainous regions of the area are not suitable for agriculture. Planed areas possesses about all the remaining three soil types including silt, clay and loam. In planed areas among these three soil types dominated one is loamy soil. Hence, it is more suitable for agriculture and farming. Therefore, planed areas are mostly fertile because of the dominancy of loamy. Silt and clay are found rarely [2]. The area has been included in subtropical regions of the country. Where climate varies continuously and the four different seasons exists including spring, autumn, summer and winter. This area has a lot of significance and advantages about their climate.

Floristic Composition

Floristic composition of a region is the total number of the species within its boundaries, weather wild or cultivated, which is a reflection of vegetation and plant resources. Plant resources are affected by agriculture, over grazing, anthropogenic interaction and natural disasters [3]. The knowledge of flora of any region is significant for the study of biodiversity and understanding of the prevailing environment. Such studies are not only a good source of botanical information of a geographic region but may also provide a suitable starting point for further comprehensive studies [4]. Hence, floristic inventory is a taxonomic study of a major division of flora in a specified area. The diversity and ecological characteristics of the plants of a particular area depend upon environmental conditions, including altitude and climate [5]. Thus ecological characteristics, such as life form, leaf spectra and phenological pattern, can be used as indicators of prevailing environmental conditions. Flora refers to all plant life occurring in any particular geographic region at a specific geological period and includes the number of species [6]. Pakistan has an important geographical position with rich floral diversity. More than 6000 vascular plants have been reported in the region. About 80% of the endemic flowering plants of Pakistan are restricted to the northern and western mountains. Various floristic studies are reported from Pakistan and contributed in the local flora [7].

Material and Methods

During research work the area were studied with field visits consecutively. In order to explore the floristic composition of Tehsil Samar bagh Dir Lower the detailed study were made and regular trips were arranged. The study was conducted from March 2021 to July 2021. In current study, data is collected from various localities and the specimens were dried, preserved and sealed according to standard method. For 15 days these specimens were preserved in newspapers and then mounted in herbarium sheets for identification [8]. 15 localities of the District were studied because these localities were richen with flora and also were representing the whole floristic composition of the District [9]. Specimens were collected along with the data family, botanical name, habit, life form leaf size classes. Plants were identified with the help of local flora, regional flora, flora of Pakistan and available literature. These samples were then submitted to the department of Botany Government Degree College Samar bagh for future record [10]. From the area a total of 120 plant species were collected through frequent trips after floristic list along with their family, botanical name, habit, life form and leaf size classes were completed [11]. Families were arranged alphabetically. The plants were ordered into 5 main groups Chamaephytes, Therophytes, Phanerophytes, Hemicryptophytes and Cryptophytes. Life form of plant species were determined by Raunkiers's method [12].

Biological Spectra

The relative numbers of plant species per biological type (as aerophytes, hygrophytes, phanerophytes, etc.) occurring in a particular ecosystem, each expressed as a percentage of the total. For biological spectrum plants were categorized into different life-form and leaf size classes which are Raunkiaer method. Life form reflects the adaptation of plants to climate. This classification is based on the position of perennating buds on the plants and the degree of their protection during adverse condition while leaf size helps in identification of physiological process of plant communities and is useful in classifying the association [8].

Raunkiaer classified all species with in a community into the following principle life form classes and leaf size classes.

Raunkiaer Life Form Classification

Phanerophytes: In these plants perennating buds are located on the twigs and branches and are exposed to the atmosphere during unfavorable periods. These plants are mostly woody like trees and shrubs, although lianas, epiphytes and some large perennial herbs can be described under this group.
Examples: The majority of conifer and dicot tree species fall into this category as do tree fern, palm trees and cycad species.

According to their heights, phanerophytes are divided into the following sub-classes:

- **Megaphanerophytes:** In this group of plants perennial parts including buds are more than 30 meters in height.
- **Mesophanerphytes:** Plants belongs to this group has height between 8 to 30 meters.
- **Microphanerophytes:** These plants having height between 2 and 8 meters.
- **Nanophanerophytes:** Height of these plants ranges

from 25 cm to 2 meters which is approximately equal to 10 to 80 inches. Shrubs and sub-shrubs are described under this class.

Chamaephytes: In these plants buds or shoot apices are situated on shoots that lie on or near the ground surface. Plants of this class are less than 25 cm in height but their perennating buds are found definitely above the soil surface. During unfavorable seasons, the buds are protected by the dead fallen leaves and on higher altitudes they are protected by snow.

Examples: Man y of the species of the maquis and other plants of submediterranean dry ecosystems are the examples of chamaephytes like *Thymus vulgaris*, *Calluna vulgaris*, *Olea europaea alpinum*, and *Rosmarinus officinalis*.

They are further divided into passive chamaephytes, active chamaephytes, subfructiose chamaephytes and cushion chamaephytes.

Hemicryptophytes: They are found on the soil surface and buds and shoots are protected by soil and dead leaves. They are herbaceous and spread on the surface horizontally as runners. The group is divided into protohemicryptophytes, partial rosette plants and rosette plants.

Examples: Some thalloid algae, rooted creepers, climbers and rosette plants are the examples of hemicryptophytes.

Cryptophytes: In this group of plants, the buds and shoots are underground. Reserved food materials are stored in the subterranean perennating organs. The class is divided into geophytes, helophytes and hydrophytes. Geophytes are further divided into rhizome geophytes, stem tuber geophytes, bulb geophytes, root tuber geophytes and root geophytes.

Examples: *Cratium maritimum*, *Crocus sativus*, and *Crocus banaticus* are the examples of cryptophytes.

Therophytes: This group includes those annual summer plants which survive under unfavorable seasons in the form of seeds. In summer all the parts of plants die except seeds and fruits. Thus, perennating bud is actually the embryo of the seed.

Examples: Therophytes are mainly represented by field weeds, for examples cornflower, pennycress and storks bill. Other examples are *Amaranthus spinosus, Angelica glauca,* and *Aster molliusculus.*

Raunkiaer Leaf Size Classification

In 1934 Christen *C. Raunkiaer* proposed a system of classification of leaves using leaf size as a relatively easy measurement that could be used to compare the adaptation of a plant community to dryness. He described his classification system by using the following 6 groups.

- **Leptophyll:** less than 25 square millimeters
- **Nanophyll:** 25-225 square millimeters
- **Microphyll:** 225-2025 square millimeters
- **Mesophyll:** 2025-18225 square millimeters
- **Macrophyll:** 18225-164025 square millimeters
- **Megaphyll:** Greater than 164025 square millimeters

Results

A total of 120 plant species belonging to 49 families were enlisted from Tehsil Samar bagh. 114 Species (95%) representing Angiosperms, Gymnosperms by 6 species (5%). Dominated family was asteraceae that represents 12 species followed by family *Rosaceae* with 10, *Solanaceae* 9 and *Papilionaceae* with 7 species. *Poaceae* and *moraceae* represents 5 species. *Fagaceae, Brassicaceae, Euphorbiaceae, Lamiaceae* and *Amaranthaceae* represent 4 species. *Polygonaceae* represents 3 species. *Apiaceae, Rhamnaceae, Amaryllidaceae*, and *Salicaceae* represents 2 species. *Apocynaceae, Ranunculaceae, Cactaceae, Papaveraceae, Asclepidiaceae, Plantaginaceae, Polygonaceae, Berberidaceae, Cactaceae, Cannabaceae, Cannaceae, Caryophyllaceae, Cuscotaceae, Cyperaceae, Ebanaceae, Fabaceae, Fumariaceae, Geriniaceae, Juglandaceae, Malvaceae, Meliaceae, Nyctaginaceae, Oleaceae, Oxiladaceae, Plantanaceae, Primulaceae, Punicaceae, Rutaceae, Sapindaceae, Simaroubaceae, Ulmaceae, Verbanaceae, Violaceae* and *Zygophylaceae* each including 1 species. Gymnosperm represents 6 species belonging to *Cuperassaceae* and *Pinaceae* both of the families has 3 species

Habit Wise Classification

Habit wise classification shows that herbs were dominating the area followed by trees and then by shrubs as shown by Shaheen, et al. [13], Inayat, et al. [14], Iqbal, et al. [15]. Habit wise categorization represents 75 herbs (62%), 13 shrubs (11%) and 32 trees (27%) as shown in the Figure 1 & Table 1.

Monocots and Dicots of the Area

In current data monocotyledons shows 8 species belonging to 3 families while dicotyledons shows 104 species belonging to 44 different families. Muhammad, et al. [16], Qureshi, et al. [17], Hussain, et al. [18] also reported dicotyledons were leading group followed by monocots.

Dominant Families

Dominated family was *Asteraceae* with 12 species each has lower relative importance with some favorable climatic conditions and due to cultivated plants that are conserved in the campus. Shaheen, et al. [13], Iqbal, et al. [15] also reported *Asteraceae* as the most leading family.

Life Form

Life form is important key in exploring the flora of an area during the studies. Life form can be considered as symbol or direction of shallow and deep climate. Therefore study of life form is an important type of vegetation description. The dominant life form was therophytes having 47 species followed by nanophanerophytes having 21 species which show that the study area are under heavy biotic pressure due to unsustainable use, over grazing and deforestation etc. of the flora of study area. Life form and leaf size spectra indicates climatic and human disturbance of a particular area. Chamaephytes contributed by 13 species followed by megaphanerophytes contributed by 12 species. Geophytes and mesophytes having 7 species whereas hemicryptophytes has 8 followed microphanerophytes with 6 species. Sher, et al. [19], Inayat, et al. [14], Rafay, et al. [20]; Ali, et al. [21] also showed that in unfavorable and dry condition the life form are mostly found therophytes followed by nanophanerophytes and chamaephytes also showed Therophytes as dominant.

Leaf Size

The present study shows that leptophylls were high at the hilly area while microphylls and nanophylls were present in plain area. Species with large leaves take place in warmer wet climates while smaller leaves are characteristic of cold and arid climates and degraded habitats. A high percentage of microphylls might be due to dry climate in area. Leaf size spectrum of the plant revealed that leading leaf size class is microphyll representing 38 species followed by mesophyll with 37 and nanophylls with 24 species were dominant in the investigated area. Microphylls are usually characteristic of steppes while nanophylls and leptophylls are characteristic of hot deserts (Figures 1-5 & Tables 1-7).

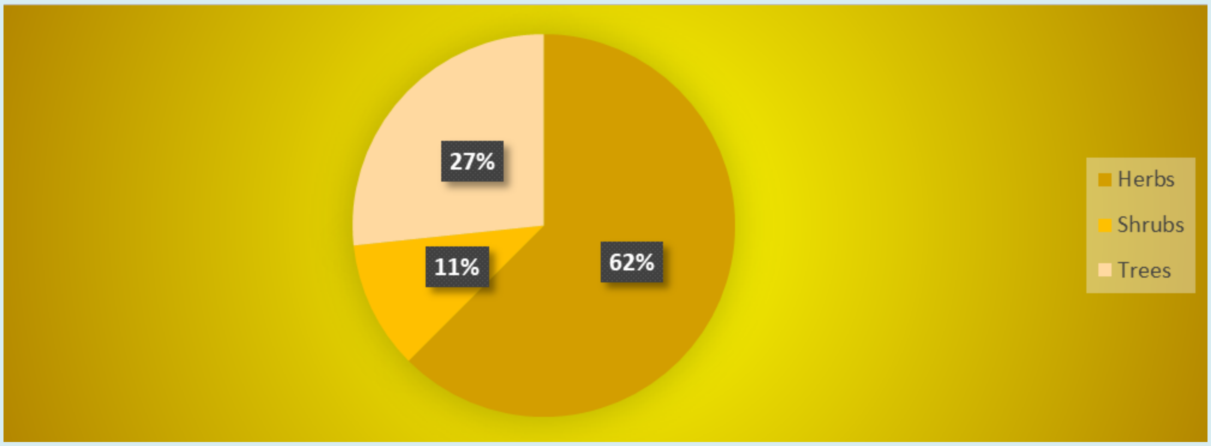

Figure 1: Habit Wise Classification.

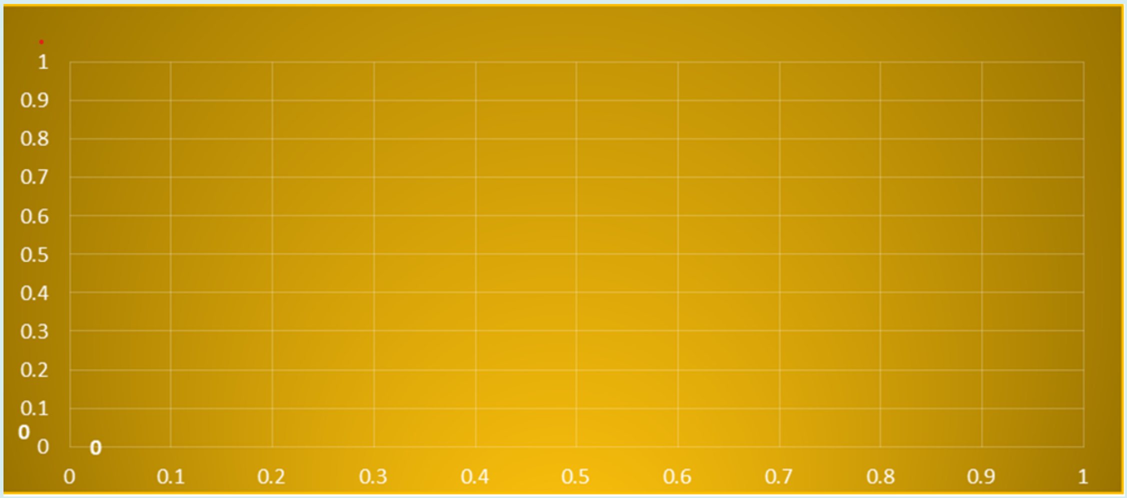

Figure 2: Monocots and Dicots of the Studied Area.

Muhammad RU and Muhammad NK. Floristic Composition and Ecological Characteristics of Tehsil Samar Bagh District Lower Dir. Open J Botanic Insight 2023, 1(1): 000106.

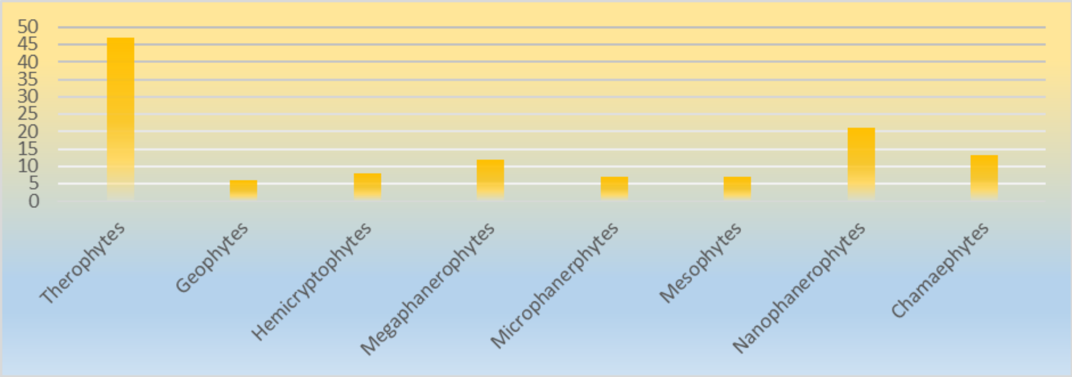

Figure 3: Life Form Wise Classification of the Selected Flora.

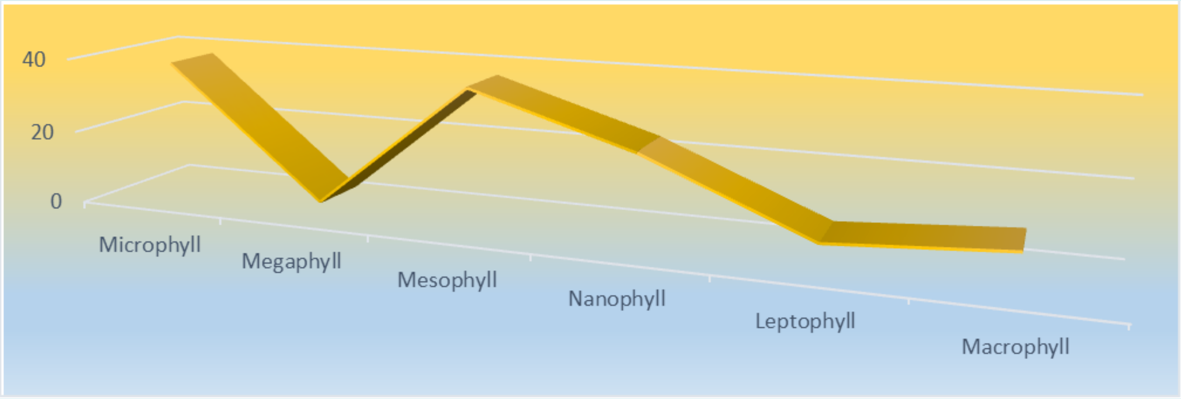

Figure 4: Leaf Size Wise Classification of the Selected Flora.

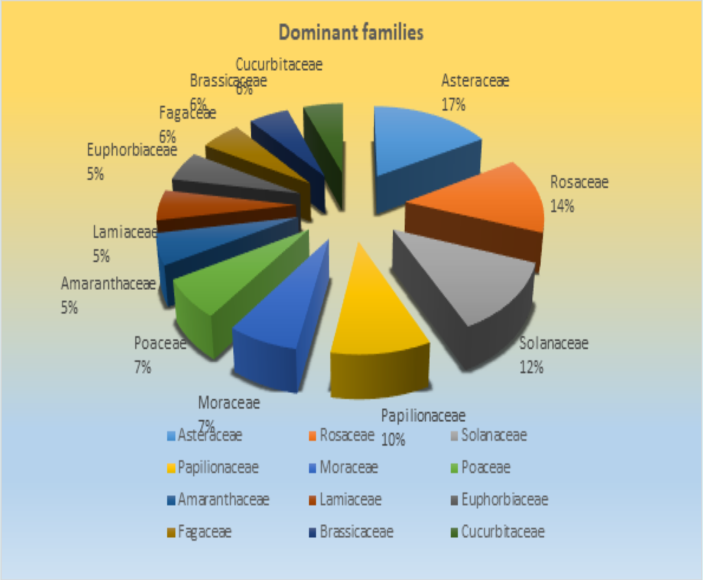

Figure 5: Dominant Families.

S.N	Angiosperm Classes	NO. of spp.	Percentage
1	Dicot	104	91%
2	Monocot	8	5%

Table 1: Tabulation of Monocots and Dicots.

S.N	Habit	No. of species	Percentage
1	Herb	75	62%
2	Shrub	13	11%
3	Trees	32	27%

Table 2: Habit Wise Tabulation.

S.N	Family	No. of spp.	Percentage
1	*Asteraceae*	12	17%
2	*Rosaceae*	10	14%
3	*Solanaceae*	9	12%
4	*Papilionaceae*	7	10%
5	*Moraceae*	5	7%
6	*Poaceae*	5	7%
7	*Amaranthaceae*	4	5%
8	*Lamiaceae*	4	5%
9	*Euphorbiaceae*	4	5%
10	*Fagaceae*	4	6%
11	*Beassicaceae*	4	6%
12	*Cucurbitaceae*	4	6%

Table 4: Dominant Families.

Life form classes	No. of Species	Percentage
Chamaephytes	13	10.83%
Nanophanerophytes	21	17.50%
Hemicryptophytes	8	6.66%
Megaphanerophytes	12	10.00%
Microphanerophytes	6	5.00%
Therophytes	47	39.16%
Geophytes	7	5.83%
Parasites	1	0.83%

Table 5: Tabulation of Life Form Classes**.**

Leaf size classes	No. of species	percentage
Leptophyll	7	5.83%
Mesophyll	37	30.83%
Nanophyll	24	20.00%
Megaphyll	5	4.16%
Microphyll	38	31.66%
Macrophyll	9	7.50%

Table 6: Tabulation of leaf size classes**.**

Extensive details of the plants along with their botanical name, family, life form, leaf form and habit are given the Table 7.

S.N	Families	Taxa	Habit	Life form class	Leaf size class
1	*Amaryllidaceae*	*Allium cepa L.*	H	G	Mes
2	*Amaryllidaceae*	*Allium sativum L.*	H	G	Mes
3	*Amaranthaceae*	*Achyranthus aspera L*	H	TH	Mes
4	*Amaranthaceae*	*Amaranthus viridis L*	H	TH	Mic
5	*Amaranthaceae*	*Digera muricata (L)*	H	CH	Mic
6	*Amaranthaceae*	*Amaranthus spinosus L.*	H	TH	Mic
7	*Apiaceae*	*Coriandrum sativum L*	H	TH	L
8	*Apiaceae*	*Foeniculum vulgare Mill.*	H	TH	Na
9	*Apocynaceae*	*Nerium oleander L.*	T	NP	Mes
10	*Asclepiadaceae*	*Calotropis procera (Wight.) Ali*	S	CH	Mes
11	*Asteraceae*	*Parthenium hysterophorus L*	H	TH	Mes
12	*Asteraceae*	*Silybum marianum (L.) Gaertn.*	H	TH	Mes
13	*Asteraceae*	*Sonchus asper (L.) Hill*	H	TH	Mic
14	*Asteraceae*	*Taraxacum officinale Weber*	H	TH	Mic
15	*Asteraceae*	*Xanthium strumarium L*	H	CH	Mes
16	*Asteraceae*	*Calendula arvensis Linn.*	H	TH	Na

17	*Asteraceae*	*Cichorium intybus Linn.*	H	TH	Mes
18	*Asteraceae*	*Conyza aegyptiaca (L.) Aito*	H	CH	Mes
19	*Asteraceae*	*Artemisia vulgaris L.*	H	CH	Mic
20	*Asteraceae*	*Lactuca dissecta D. Don*	H	TH	Mic
21	*Asteraceae*	*Sonchus arvensis L.*	H	TH	Mic
22	*Asteraceae*	*Sonchus oleraceus L.*	H	TH	Mic
23	*Berberidaceae*	*Berberis jaeschkeana Schneid.*	S	NP	Mic
24	*Brassicaceae*	*Brassica rapa L.*	H	TH	Mac
25	*Brassicaceae*	*Nasturtium officinale R. Br*	H	G	Mic
26	*Brassicaceae*	*Capsella bursa-pastoris (L.)*	H	TH	Mic
27	*Brassicaceae*	*Brassica copmpestris L*	H	TH	Mac
28	*Cactaceae*	*Opuntia littoralis (Engelm.)*	S	NP	L
29	*Cannabaceae*	*Cannabis sativa L.*	H	TH	Mic
30	*Cannaceae*	*Canna indica L.*	H	CH	Meg
31	*Caryophyllaceae*	*Stellaria media (L.) Vill.*	H	TH	Na
32	*Convolvulaceae*	*Convolvulus arvensis L.*	H	TH	Mes
33	*Cucurbitaceae*	*Cucumis melo L.*	H	TH	Mac
34	*Cucurbitaceae*	*Cucumis sativus L*	H	TH	Mac
35	*Cucurbitaceae*	*Cucurbita maxima Duch. ex*	H	TH	Mac
36	*Cucurbitaceae*	*Luffa cylindrica (L.) Roem*	H	TH	Mac
37	*Cupressaceae*	*Cupressus sempervirens L.*	T	MICP	L
38	*Cupressaceae*	*Juniperus communis L.*	T	NP	L
39	*Cupressaceae*	*Thuja orientalis L.*	T	NP	L
40	*Cuscutaceae*	*Cuscuta reflexa Roxb*	H	P	AP
41	*Cyperaceae*	*Cyperus rotundus L*	H	G	Mic
42	*Ebenaceae*	*Diospyros lotus L.*	T	MEGP	Mes
43	*Euphorbiaceae*	*Euphorbia helioscopia L.*	H	TH	Na
44	*Euphorbiaceae*	*Euphorbia prostrata Ait.*	H	TH	L
45	*Euphorbiaceae*	*Euphorbia milli L*	H	NP	Mac
46	*Euphorbiaceae*	*Ricinus communis L.*	S	NP	Mac
47	*Fagaceae*	*Quercus baloot Griffth*	T	MES	Mic
48	*Fagaceae*	*Quercus incana Roxb.*	T	MES	Mic
49	*Fagaceae*	*Quercus semecarpifolia Smith*	T	MES	Mic
50	*Fagaceae*	*Quercus dilatata lindl. ex Royle*	T	MES	Mic
51	*Fumariaceae*	*Fumaria indica L*	H	TH	Na
52	*Geraniaceae*	*Geranium rotundifolium L.*	H	TH	Mic
53	*Juglandaceae*	*Juglans regia L.*	T	CH	Na
54	*Lamiaceae*	*Ajuga bracteosa Wall. ex Bth.*	H	TH	Mic
55	*Lamiaceae*	*Mentha arvensis L.*	H	G	Na
56	*Lamiaceae*	*Mentha longifolia (L.)*	H	G	Na
57	*Lamiaceae*	*Salvia moorcroftiana Wall. ex*	H	TH	Mac

58	*Malvaceae*	*Malva neglecta Wall*	H	TH	Mes
59	*Meliaceae*	*Melia azedarach L.*	T	MEGP	Na
60	*Moraceae*	*Morus alba L*	T	MEGP	Mes
61	*Moraceae*	*Morus negra L*	T	MEGP	Mes
62	*Moraceae*	*Picus carica L*	T	MEGP	Mes
63	*Moraceae*	*Picus palmate forssk*	T	MEGP	Mes
64	*Moraceae*	*Broussonitia pyrifera(L.) Vent*	T	MEGP	Meg
65	*Nyctaginaceae*	*Mirabilis jalapa L.*	H	NP	Na
66	*Oleaceae*	*Olea ferruginea Royle*	T	NP	Mic
67	*Oxalidaceae*	*Oxalis corniculata L.*	H	TH	Na
68	*Papaveraceae*	*Papaver somniferum L.*	H	TH	Mes
69	*Papilionaceae*	*Trifolium repens L.*	H	H	Na
70	*Papilionaceae*	*Pisum sativum L. var. sativum*	H	TH	Mic
71	*Papilionaceae*	*Phaseolus lunatus L.*	H	CH	Mes
72	*Papilionaceae*	*Medicago polymorpha L.*	H	TH	Na
73	*Papilionaceae*	*Lathyrus aphaca L.*	H	TH	Mic
74	*Papilionaceae*	*Indigofera heterantha Wall. ex*	H	NP	L
75	*Papilionaceae*	*Lathyrus sativus L.*	H	TH	Na
76	*Pinaceae*	*Cedrus deodara*	T	MEGP	Na
77	*Pinaceae*	*Pinus roxburghii Sargent*	T	MEGP	Na
78	*Pinaceae*	*Pinus wallichiana A.B. Jackson*	T	MEGP	Na
79	*Plantaginaceae*	*Plantago lanceolata L.*	H	TH	Mic
80	*Plantanaceae*	*Platanus orientalis L.*	T	MEGP	Mes
81	*Poaceae*	*Zea mays L.*	H	TH	Mes
82	*Poaceae*	*Triticum aestivum L.*	H	TH	Mic
83	*Poaceae*	*Cynodon dactylon (L.)*	H	H	Mic
84	*Poaceae*	*Saccharum officinarum L*	H	H	Mic
85	*Poaceae*	*Phalaris minor L*	H	CH	Mic
86	*Polygonaceae*	*Rumex dentatus L.*	H	CH	Mes
87	*Polygonaceae*	*Rumex hastatus D. Don*	H	CH	Na
88	*Polygonaceae*	*Polygonum barbatum L*	H	CH	Mic
89	*Primulaceae*	*Anagallis arvensis L.*	H	TH	Na
90	*Punicaceae*	*Punica granatum L.*	T	MICP	Mic
91	*Ranunculaceae*	*Clematis grata Wall*	T	NP	Mic
92	*Rhamnaceae*	*Ziziphus jujuba Mill.*	T	NP	Mic
93	*Rhamnaceae*	*Zizyphus oxyphylla Edgew.*	T	PP	Mic
94	*Rosaceae*	*Duchesnea indica (Andr.) Focke*	H	H	Mic
95	*Rosaceae*	*Fragaria vesca L.*	H	H	Mic
96	*Rosaceae*	*Rosa webbiana Wall. ex Royle*	S	NP	Na
97	*Rosaceae*	*Rosa alba L*	S	NP	Na
98	*Rosaceae*	*Rosa indica L.*	S	NP	Mic

99	*Rosaceae*	*Rosa alba L.*	S	NP	Na
100	*Rosaceae*	*Rubus fruticosus L.*	S	NP	Mes
101	*Rosaceae*	*Prunus armeniaca L.*	T	MICP	Mes
102	*Rosaceae*	*Prunus domestica L.*	T	MICP	Mes
103	*Rosaceae*	*Prunus persica (L.) Batsch.*	T	MICP	Mes
104	*Salicaceae*	*Populus alba L.*	T	MES	Mes
105	*Salicaceae*	*Salix babylonica L.*	T	MES	Mes
106	*Sapindaceae*	*Dodonaea viscosa (L.) Jacq.*	S	NP	Mes
107	*Simaroubaceae*	*Ailanthus altissima (Mill.)*	T	MEGP	Mes
108	*Solanaceae*	*Capsicum frutescens L.*	H	NP	Mes
109	*Solanaceae*	*Datura stramonium L.*	H	TH	Mes
110	*Solanaceae*	*Lycopersicon esculentum Miller*	H	TH	Mes
111	*Solanaceae*	*Solanum nigrum L. var. nigrum*	H	TH	Mes
112	*Solanaceae*	*Solanum tuberosum L.*	H	H	Mes
113	*Solanaceae*	*Capsicum annuum L.*	H	TH	Mic
114	*Solanaceae*	*Datura innoxia Mill.*	H	TH	Mes
115	*Solanaceae*	*Datura metel L*	S	NP	Mes
116	*Solanaceae*	*Withania somnifera (L) Dunal*	S	CH	Mes
117	*Ulmaceae*	*Celtis caucasica Willd*	T	MEGP	Meg
118	*Verbinaceae*	*Vitex negundo L.*	S	NP	Na
119	*Violaceae*	*Viola biflora L.*	H	TH	Mic
120	*Zygophyllaceae*	*Tribulus terrestris L.*	H	H	Na

Table Keywords: Life Form Classes: Therophytes=TH, Nanophanerophytes=NP, Hemicryptophytes=H, Chamaephytes=CH, Geophytes=G, Megaphanerophytes=MEGP, Microphanerophytes=MICP
Leaf Size Classes: Nanophyll=Na, Mesophyll=Mes, Microphyll=Mic, Megaphyll=Meg, Leptophyll=L, Macrophyll=Mac

Table 7: Floristic Checklist of the Selected Flora of Tehsil Samar Bagh District Dir Lower.

Discussion

Pakistan has been gifted by nature with a lot of natural resources with uses and advantages. One of them is Pakistan is rich floristically because of their various climatology, different soil conditions and multiple ecological regions. Pakistan has a rich and diverse flora, with about 1572 genera and around 6000 plant species. These 6000 plant species includes 128 species of pteridophytes, 23 species of gymnosperms. 4492 species of Dicots and 1508 species of monocots of flowering plants (angiosperms) has reported. These plants species are mostly common in the Hindu Kush, Himalaya and Karakorum regions. The locality of mountain range possess most of medicinal plants which is used for the treatment of common ailments in the local communities of the area. Approximately 400-600 plants are widely used their medicinally. It is clear that abundant plant species of the area are reducing day by day. It's because an ecologically operating problem of the area is grazing, browsing, and trampling by domestic animals. These elements cause species not to reach its climax stage. Grazing is one of the depressing aspects, which has caused the reduction in vegetation [22]. In these processes the palatable species are selected and these make the non-palatable species to increase. This can be noticeably seen in many places, which results in stunting growth and not reaching to flowering stage: so these are a danger of their extinction. The most important factors disturbing the Flora of area are humidity, light, temperature, soil conditions, topography, and elevation from sea level, rain fall and other forms of precipitation. On soil having high Nitrogen content are found *Malva neglecta, Chenopodium album* etc, as occurring near human duellings, on compost heaps and in back yards. The finding is similar with that of Khan, et al. [22], Khan and Hussain, et al. [23]; Khan, et al. [24]. There are many other causes in reduction of flora of the area, such as lack of awareness about the importance of plants. Therefore, they use these plants for commercial purposes and mostly for burning, fodder and furniture. Nowadays the most often affected plants of the area are *Querus incana, Picus carica, Pinus spp, Populus oriantalus, Juglans regia, Berberis lyceum, Oleam spp and Nigella sativa.* The above described plants are usually use in making of furniture. *Morus alba, Melia azedarach, Ziziphus jujuba* are used for burning purposes. If these plants are demolishing with such a rate continually without taking any action against it, than it may cause criticism of flora. According to the Raunkiaer that climate of a region is characterized by life form. Plant species were identified and classified into major life forms to build bio-spectrum. The biological spectra is helpful to comparing geographically far and wide separated plant communities and used as an indicator of prevailing environment. Biological spectrum may be significantly changed due to preface of therophytes like annual weeds, biotic pressure like agricultural practices and grazing, deforestation and trampling etc. The dominance of therophytic life form showed that the area was under heavy biotic pressure. Our results agree with that of Khan, et al. [25]*;* Khan, et al. [24]. The region is extremely prosperous in biodiversity. In the current study, the high percentage of therophytes is supported in the study region for the reason that the region is semiarid zone of Khyber Pakhtunkhwah. The dominance of therophytes indicated that the investigated area was under heavy biotic pressure due to deforestation and over grazing. Most of the plants were uprooted for burning purposes and grazed by the livestock. Many plant species were decreasing in the area and special care is needed for their plant life conservation. Many fruits are worn out annually due to non-availability of marketplace. The market convenience has fine result on plants and on nation. Medicinal farm should be set up in the area to support the essential importance of the plants and its conservation. The chief Agriculture crops are Wheat, different legumes, fodder crops and barely, grown. On hills different grasses, *Acacia modesta, Achyranthus aspera, Calotropis procera, Carthamus oxycantha, Conyza aegyptiaca, Xanthium strumarium* and *Opuntia littoralis* etc are commonly found. Mostly the Xerophytes such as *Broussonitia papyrifera, Ficus carica, Ficus palmata, Morus alba, Morus negra, Eucalyptus camaldulensis, Eucalyptus lanceolatus* etc are found on road sides while *Melia azedarach, Ficus religiosa, Prunus persica* and *Alianthus althesema* etc. are commonly found in Grave-yards. Such type of study was also taken by Musharaf, et al. [24] The predominant species of the area were *Picus carica, Morus alba, Morus negra, Nusturtium officinale, Cannabis sativa, Cyperus rotundus, Ajuga bracteosa, Mentha arvensis, Mentha longifolia, Melia azedarach, Olea ferruginea, Oxalis corniculata, Dodonaea viscosa, Parthenium hysterophorus, Amaranthus viridis, Taraxacum officinale, Fumaria indica* etc.

Conclusion

This survey of floristic composition reveals 120 plant species including 114 angiosperm and 06 gymnosperms species. Families including 03 monocot, 44 dicot and 02 gymnosperms. Family Asteraceae with 12 species was the most dominant in all followed by Rosaceae with 10 species. Herbaceous cover was dominant with 62% followed by trees with 31% and shrubs by 11% of the total flora. 67% of the flora is wild in nature and the remaining 33% are cultivated. Therophytes were dominant in life form class and microphyll were in leaf size class. In the current survey we concluded that this area has diverse flora, rich enough floristically and has significance from biodiversity point of view. Dominated plants were therophytes which recommends that the study area is semiarid region of Khyber Pakhtunkhwah. Abundance of therophytes demonstrated that because of over utilization, over collection, over exploitation, habitat degradation, overharvesting, deforestation, population explosion, over grazing and deforestation the area is under high biotic pressure this may disturb supportability of life in the globe.

References

1. Ihsan U, Din SU, Ullah F, Khan SU, Khan A, et al. (2016) Floristic Composition, Ecological Characteristics and Biological Spectrum of District Bannu, Khyber Pakhtunkhawa, Pakistan. Journal of Human Ecology 54(1): 1-11.

2. Saima S, Dasti AA, Abbas Q, Hussain F (2010) Floristic Diversity During Monsoon In Ayubia National Park, District Abbottabad, Pakistan. Pakistan Journal of Plant Sciences 16(1).

3. Amjad MS, Arshad M, Page S, Qureshi R, Mirza SN, (2017) Floristic composition, biological spectrum and phenological pattern of vegetation in the subtropical forest of Kotli District, AJK, Pakistan. Pure and Applied Biology (PAB) 6(2): 426-447.

4. Negi VS, Maikhuri RK, Rawat LS (2011) Non-timber forest products (NTFPs) a viable option for biodiversity conservation and livelihood enhancement in central Himalaya. Biodiversity and Conservation 20(3): 545-559.

5. Singh NP, Singh DK, Uniyal BP (2002) Flora of Jammu and Kashmir Kolkata. Botanical Survey of India.

6. Amber K, Khan KR, Shah AH, Farooq M, Lodhi MH, et al. (2019) A comprehensive survey of floristic diversity evaluating the role of institutional gardening in conservation of plant biodiversity. International Journal of Biosciences 14(3): 325-339.

7. Saeed SH, Hussain M, Shah GM (2018) Floristic checklist of Datta, district Mansehra Khyber Pakhtunkhwa, Pakistan. Science International 30(4): 517-522.

8. Anwar S, Khan SM, Ahmad Z, Ullah Z, Iqbal M (2019) Floristic composition and ecological gradient analyses of the Liakot Forests in the Kalam region of District Swat, Pakistan. Journal of Forestry Research 30(4): 1407-1416.

9. Sultan Ud, Din AH, Ali H, Ali H, (2016) Floristic composition and life form classes of district Shangla, Khyber Pakhtunkhwa, Pakistan. J Bio Env Sci 8(3): 187-206.

10. Ali A, Badshah L, Hussain F, Shinwari ZK, (2016) Floristic composition and ecological characteristics of plants of chail valley, district Swat, Pakistan. Pak J Bot 48(3): 1013-1026.

11. Mehmood A, Khan SM, Shah AH, Shah AH, Ahmad H (2016) First floristic exploration of the district Torghar, Khyber Pakhtunkhwa, Pakistan. Pak J Bot 47: 57-70.

12. Wariss HM, Mukhtar M, Anjum S, Bhatti GR, Pirzada SA (2013) Floristic composition of the plants of the Cholistan Desert, Pakistan. American Journal of Plant Sciences 4(12).

13. Shaheen S, Iqbal Z, Ijaz F, Alam J, Rahman IU (2016) Floristic composition, biological spectrum and phenology of Tehsil Havelian, District Abbottabad, Pakistan. Pak J Bot 48(5): 1849-1859.

14. Inayat N, Ullah A, Rashid A (2014) Floristic Composition And Ecological Prevalence Of The Weed Species Growing In Wheat And Sugar Cane Fields Of District Charsadda, Khyber Pakhtunkhwa, Pakistan. Pakistan Journal of Weed Science Research 20(3).

15. Rahman IU, Afzal A, Iqbal Z, Ijaz F, Ali N (2018) First insights into the floristic diversity, biological spectra and phenology of Manoor Valley, Pakistan. Pak J Bot 50(3): 1113-1124.

16. Durrani MJ, Razaq A, Muhammad SG, Hussain F (2009) Floristic Diversity, Ecological, Characteristics and Ethnobotonical Profile Of Plants Of Aghberg Rangelands, Balochistan, Pakistan. Pakistan Journal of Plant Sciences 16(1).

17. Shaheen H, Qureshi R, Akram A, Gulfraz M, Potter D (2014) A preliminary floristic checklist of Thal Desert Punjab, Pakistan. Pak J Bot 46(1): 13-18.

18. Saima S, Dasti AA, Hussain F, Wazir SM, Malik SA (2009) Floristic compositions along an 18-km long transect in ayubia National Park district Abbottabad, Pakistan. Pak J Bot 41(5): 2115-2127.

19. Sher Z, Hussain F, Badshah L, Wahab M (2011) Floristic composition, communities and ecological characteristics of weeds of wheat fields of Lahor, District Swabi. Pakistan Pak J Bot 43(6): 2817-2820.

20. Rafay M, Khan RA, Yaqoob S, Ahmad M (2013) Floristic composition of grass species in the degrading rangelands of Cholistan desert. Pak J Agri Sci 50(4): 599-603.

21. Ali S, Shuaib M, Ali H, Ullah S, Ali K, et al. (2017) Floristic list and their ecological characteristics, of plants at village Sherpao District Charsadda, KP-Pakistan. Journal of Medicinal Plants 5(5): 295-299.

22. Khan M, Hussain F, Musharaf S, (2012) Preliminary floristic range of Tehsil Takht-e-Nasrati Pakistan. Int J Biosci 1(6): 88-99.

23. Khan M, Hussain F, Musharaf S (2013) Floristic composition and biological characteristics of the vegetation of Sheikh Maltoon Town District Mardan, Pakistan. Annual Research & Review in Biology 31-41.

24. Khan M, Hussain F, Musharaf S (2014) Floristic Composition and Ecological Characteristics of Shahbaz Garhi, District Mardan, Pakistan. Global Journal of Science Frontier Research 14(1): 7-17.

25. Khan SW, Qamar Abbas AH, Hussain A, Ali H, Ali S (2021) Assessment Of Floristic Diversity In The Desert Ecosystem Of Central Karakoram National Park (Karakoram Range) Gilgit-Baltistan, Pakistan. Pak J Bot 53(3): 1025-1036.

26. Ahmed M, Husain T, Sheikh AH, Hussain SS, Siddiqui MF (2006) Phytosociology and structure of Himalayan forests from different climatic zones of Pakistan. Pakistan Journal of Botany 38(2) :361.

27. Ahmed M, Nazim K, Siddiqui MF, Wahab M, Khan N (2010) Community description of Deodar forests from Himalayan range of Pakistan. Pak J Bot 42(5): 3091-3102.

28. Badshah L, Hussain F, Sher Z (2013) Floristic inventory, ecological characteristics and biological spectrum of rangeland, District Tank, Pakistan. Pak J Bot 45(4): 1159-1168.

29. Dar ME, Cochard R, Shrestha RP, Ahmad S (2012) Floristic composition of Machiara National Park, District Muzaffarabad Azad Kashmir, Pakistan. Int J Biosci 2(4): 28-45.

30. Fazal H, Ahmad N, Rashid A, Farooq S (2010) A checklist of phanerogamic flora of Haripur Hazara, Khyber Pakhtunkhwa, Pakistan. Pak J Bot 42(3): 1511-1522.

31. Haq A, Badshah L (2021) Floristic description and ecological characteristics of the plants of Pashat Valley, Pak-Afghan border, district Bajaur, Pakistan. Acta Ecologica Sinica 41(6): 524-536.

32. Hassan G, Khan I, Ahmad KI, (2006) Studies on floristic composition of chickpea weeds in district Karak, Pakistan.

33. Hassan G, Khan I, Hussain MZ, Shah NH, Khan M, (2010) Weed flora of chickenpea in district Lakki Marwat, NWFP, Pakistan. Sarhad J Agric 26(1): 79-86.

34. Hayat SA, Hussain F, Zhu H, Asad, F (2019) Floristic Composition And Ecological Characteristics of Plants Of Tehsil Razar, Swabi District, Pakistan. Silva 20.

35. Ilyas M, Shinwari ZK, Qureshi R (2012) Vegetation composition and threats to the montane temperate forest ecosystem of Qalagai hills, Swat, Khyber Pakhtunkhwa, Pakistan. Pak J Bot 44: 113-122.

36. Khan KR, Farooq M, Shah AH, Iqbal Z, Alam J (2020) Floristic composition, community syntaxonomy and ordination of Guzara (unprotected) forests of Hilkot range, District Mansehra, KP, Pakistan. Proceedings of the International Academy of Ecology and Environmental Sciences 10(1): 8-21.

37. Malik RN, Husain SZ (2006) Classification and ordination of vegetation communities of the Lohibehr reserve forest and its surrounding areas, Rawalpindi, Pakistan. Pakistan Journal of Botany 38(3): 543-558.

38. Mehmood A, Khan SM, Shah AH, Shah AH, Ahmad H (2016) First floristic exploration of the district Torghar, Khyber Pakhtunkhwa, Pakistan. Pak J Bot 47: 57-70.

39. Shah AA, Rehman KU, Muhammad M, Abbas M, Khan N, et al. (2021) Floristic Composition and Phytosociological Studies of Weeds of Garlic (*Allium sativum*) Crop of District Bannu, Khyber Pakhtunkhwa, Pakistan. Elementary Education Online 20(5): 6863-6869.

40. Siddiqui S, Shirazi SA, Ali A (2016) A floristic analysis of selected parks in Lahore Pakistan. Journal of the Punjab University Historical Society 29(2): 182-195.

41. Ullah S, Badshah L (2017) Floristic structure and ecological attributes of Jelar valley flora, district Upper Dir, Pakistan. JBES 10(5): 89-105.

42. Zeb U, Khan H, Gul B, Khan WM (2016) Floristic composition and phytosociological studies of Hazar Nao hills, District Malakand, Khyber Pakhtunkhwa, Pakistan. Pakistan Journal of Weed Science Research 22(2).

43. Blondel J, Aronson J (1999) Biology and wildlife of the Mediterranean region. Oxford University Press.

44. Akiyama T, Kawamura K (2007) Grassland degradation in China: methods of monitoring, management and restoration. Grassland science 53(1): 1-17.

45. Peri PL, Lencinas MV, Bousson J, Lasagno R, Soler R (2016) Biodiversity and ecological long-term plots in Southern Patagonia to support sustainable land management: The case of PEBANPA network. Journal for nature conservation 34: 51-64.

46. Oliveira Filho AT, Fontes M (2000) Patterns of floristic differentiation among Atlantic Forests in Southeastern Brazil and the influence of climate. Biotropica 32(4b): 793-810.

47. Datta D, Deb S (2017) Forest structure and soil properties of mangrove ecosystems under different management scenarios: Experiences from the intensely humanized landscape of Indian Sunderbans. Ocean & Coastal Management 140: 22-33.

48. Cardoso D, Sarkinen T, Alexander S, Amorim AM, Bittrich V, et al. (2017) Amazon plant diversity revealed by a taxonomically verified species list. Proceedings of the National Academy of Sciences 114(40): 10695-10700.

49. Azra B (2012) Environment and forest management in India. Unpublished Ph D. Thesis. Department of Economics, Aligarh Muslim University, Aligarh.

50. Janni KD (2003) Global patterns of plant diversity: Alwyn H. Gentry's forest transect data set. Economic Botany 57(2): 283-283.

51. Garnier E, Grigulis K (2016) Plant functional diversity: organism traits, community structure, and ecosystem properties. Oxford University Press.

52. Sher Z, Khan Z (2007) Floristic composition, life form and leaf spectra of the vegetation of Chagharzai Valley, District Buner. Pakistan Journal of Plant Sciences.

53. Rashid A, Swati MF, Sher H, Al Yemeni MN (2011) Phytoecological evaluation with detail floristic appraisal of the vegetation around Malam Jabba, Swat, Pakistan. Asian Pacific journal of tropical biomedicine 1(6): 461-467.